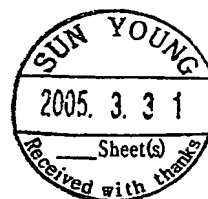


## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)



Applicant's or agent's file reference FGPE03-003	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR2003/002683</b>	International filing date (day/month/year) <b>08 DECEMBER 2003 (08.12.2003)</b>	Priority date (day/month/year) 10 DECEMBER 2002 (10.12.2002)
International Patent Classification (IPC) or national classification and IPC  <b>IPC7 H01L 33/00, H01L 21/20, H01S 5/30</b>		
Applicant  <b>LG INNOTEK CO., LTD et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the report
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>06 APRIL 2004 (06.04.2004)</b>	Date of completion of this report  25 MARCH 2005 (25.03.2005)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  KIM, Dong Yup  Telephone No. 82-42-481-5749 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/002683

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item:

- These elements were available or furnished to this Authority in the following language English which is
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2003/002683

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	2-4, 9, 11-12	YES
	Claims	1, 5-8, 10	NO
Inventive step (IS)	Claims	9, 12	YES
	Claims	2-4, 11	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims	NONE	NO

### 2. Citations and explanations (Rule 70.7)

(1) The documents cited in the International Search Report:

D1 : KR 2001-87235 A      D2 : JP 09-326506 A      D3 : KR 1998-66847 A  
D4 : JP 10-256588 A      D5 : KR 2000-18855 A

(2) Novelty (Claims 1, 5-8, 10)

The subject-matter of claims 1, 5-8, 10 is about a quantum-dot LED device comprising : a substrate ; an n-typed semiconductor layer ; quantum dots filling the internals of the holes ; and a p-typed semiconductor layer.

But D1 discloses a light emitting diode comprising : a p-typed semiconductor layer ; an intrinsic semiconductor layer containing quantum holes ; and an n-typed semiconductor layer (figure 7, claims 1-4 and a detailed description on the invention). And D3 also discloses a manufacturing method of a LED display in which quantum dots are dispersed in the insulating layer (figure 1 and claim 1).

Therefore, the subject-matter of claims 1, 5-8, 10 lacks novelty under PCT Article 33(2).

(3) Inventive Step (Claims 2-4, 11)

The subject-matter of claims 2-4, 11 is about a quantum-dot LED device comprising : a substrate ; an n-typed semiconductor layer ; a first insulating layer containing holes ; quantum dots filling the internals of the holes ; a barrier layer ; a second insulating layer ; and a p-typed semiconductor layer.

While D1 discloses a light emitting diode comprising : a p-typed semiconductor layer ; an intrinsic semiconductor layer containing quantum holes ; and an n-typed semiconductor layer (figure 7, claims 1-4 and a detailed description on the invention), D2 discloses a quantum semiconductor device in which a plurality of intermediate layers containing quantum dots are prepared and a manufacturing method thereof (figure 1, claims 1-32).

As mentioned above, the features of claims 2-4, 11 are already disclosed in D1 and D2 in a similar field of application, or are included among the several straightforward possibilities or combinations from which a skilled person could select without an exercise of the inventive skill.

Therefore, the subject matter of Claims 2-4, 11 lacks an inventive step under PCT Article 33(3).

(4) Industrial Applicability

The subject matter of Claims 1-12 is considered to be industrially applicable. ( PCT Article 33(3))